

Notice of Allowability

Application No.

09/682,363

Examiner

Anthony Fick

Applicant(s)

ZUPPERO ET AL.

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's RCE of 9/28/06.
2. ☒ The allowed claim(s) is/are 20-37,39-46,48,49 and 51-57.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Remarks

1. Applicant's amendments to the claims have overcome the previous rejections under 35 U.S.C. 112 first and second paragraphs and thus those rejections are withdrawn.

Terminal Disclaimer

2. The terminal disclaimer filed on September 13, 2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent Nos. 6,114,620, 6,222,116, 6,268,560, 6,649,823, 6,944,202 and 6,916,451 has been reviewed and is accepted. The terminal disclaimer has been recorded.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jeffrey Miller on December 4, 2006.

The application has been amended as follows:

a) Claim 48, line 7: "at least partly bounds the" has been replaced with the following – is in contact with a – .

Art Unit: 1753

b) Claim 48, line 8: between "region" and "and" the following has been inserted –
that is completely or partly enclosed by the first surface – .

Allowable Subject Matter

4. Claims 20 through 37, 39 through 46, 48, 49 and 51 through 57 are allowed.
5. The following is an examiner's statement of reasons for allowance: the present invention involves a pulsed electric generator with an emitter with a reaction surface that emits hot electrons in pulses to the reaction surface and a collector near the reaction region with a conductor that is in contact with a semiconductor such that the hot electrons travel through the conductor into the semiconductor to produce electrical energy. The closest prior art is from Fletcher et al. (U.S. 4,045,359) and Few et al. (U.S. 5,404,712).

Fletcher extracts excess energy from an unstable, vibrationally excited species by contacting the species with the surface of a finely divided solid (see abstract; col. 2, lines 3-11; col. 2, line 67 through col. 3, line 16; and, col. 4, lines 8-22). For example, using the apparatus of figures 1 or 2, gas reactants A and B absorb energy to form photonicly excited species A* and/or B*, which in turn react to form an unstable excited reactant C* (see the paragraph bridging cols. 2 and 3). C* is stabilized by transient contact with the passive surface of a finely divided particle (12) during which excess energy is transferred to the surface (see col. 3, lines 2-5). Likewise, said surface can also absorb energy from B* (see col. 3, line 9). The reactants are excited using a laser light source (col. 2, lines 45-46 and col. 3, lines 17-32), which can supply pulses of energy in view of the fact that the laser can be discontinuous (col. 2, lines 47-50).

Art Unit: 1753

Fletcher's photon-induced reaction can be used for catalytic conversion in automobiles with the advantage that platinum is not necessary (see col. 4, lines 8-22).

Fletcher does not specifically teach extracting a net excess of useful work or electrical energy. The prior art does teach utilizing heat from catalytic converters via thermoelectric devices to produce electricity. However, the thermoelectric devices would not have a conductor whose first surface completely or partially encloses the reaction region. The conductors in the thermoelectric devices are small traces that link individual thermoelectric legs to each other in series and a large conductor would short out the thermoelectric device. Thus Fletcher does not meet the claimed invention and the obvious modifications of Fletcher to produce electricity also do not meet all the requirements of the claims.

Few teaches an apparatus for igniting an air/fuel spray for a gas turbine engine, the apparatus comprising an emitter that is the opening in the combustion chamber wall (22), wherein pulsed laser beam (20) is directed into the chamber, and wherein the instant reaction surface of the emitter corresponds to the surfaces of said wall (22) at said opening (see figure 1; and col. 3, line 61 through col. 5, line 65). The inside of the chamber (22) corresponds to the instant reaction region and surrounds said opening. Pulses of radiation are supplied to the fuel/air mixture in the chamber so as to generate free electrons and develop a plasma, and the free electrons are accelerated to hot electrons which extend over a large area of the combustion chamber (22) (see abstract; and col. 4, line 61 through col. 5, line 14).

Few does not specifically teach the instant collector near the reaction region. The prior art does teach using thermoelectric power generating elements on the inside surface of a combustion chamber for a gas turbine engine. However this combination still does not meet the instant invention as the thermoelectric devices do not have a conductor whose first surface completely or partially encloses the reaction region. The surface in Few surrounding the reaction region (22) cannot be a conductor as the device needs free electrons to stay within the chamber. Therefore it would not be obvious to modify Few to place a collector with a conductor that completely or partially encloses the reaction region as it would destroy the invention of Few. The collector of the present invention is not taught by the prior art and it would not be obvious to modify the prior art to utilize such a collector. Thus the claims are allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *AOF*
AU 1753
December 8, 2006


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700